

Serial No.: 10/055,094
Group Art Unit: 2823

AMENDMENTS TO CLAIMS

- Please delete claims 4 and 11-33.
- Please amend pending claims 1 and 5 as indicated below.
- Please add new claims 34-42.

A complete listing of all claims and their status in the application are as follows:

1. (currently amended) A method for anchoring a heat spreader of a Plastic Ball Grid Array (PBGA) package to the surface of an underlying substrate of the PBGA package, comprising the steps of:

(a) providing a substrate for a PBGA package, said substrate having been provided with heat spreader anchor posts over the surface thereof, said heat spreader anchor posts being separated by a first distance;

(b) providing a heat spreader for a PBGA package, said heat spreader having a first and a second surface, said first surface facing said substrate, said first surface having been provided with a layer of electrically non-conductive material, said heat spreader comprising:

(i) a horizontal portion, being parallel with the surface of said substrate of said PBGA package;

(ii) heat spreader stand-off features;

(iii) said heat spreader stand-off features having a contact surface providing contact between said heat spreader and said substrate;

(iv) said contact surface of said heat spreader stand-off features having been provided with openings there-through; and

(v) said openings provided through said contact surfaces being separated by a distance of said first distance;

(c) aligning said anchor posts provided over the surface of said substrate with said openings provided through said contact surfaces of said stand-off features of said heat spreader; and

(d) inserting said anchor posts provided over the surface of said substrate into said openings provided through said contact surfaces of said stand-off features of

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said heat spreader, creating anchor posts protruding through said openings provided through said contact surfaces.

2. (original) The method of claim 1, said anchor posts comprising deposits of thermally and electrically conductive material, said thermally and electrically conductive material having been cured after deposition thereof.

3. (original) The method of claim 1, said anchor posts comprising a material selected from the group consisting of epoxy to which traces of silver have been added and solder paste and a solid metal.

4. (canceled)

5. (currently amended) The method of ~~claim 4~~ claim 1, said providing said first surface of said heat spreader with a layer of electrically non-conductive material comprising a method selected from the group consisting of coating and depositing and chemically treating the first surface of said heat spreader.

6. (original) The method of claim 1, said anchor posts having been created applying methods is dispensing or printing of electrically and thermally conductive material.

7. (original) The method of claim 6, said conductive material comprising epoxy to which traces of silver have been added.

8. (original) The method of claim 1, said anchor posts having been created applying methods of solder bump or contact point creation.

9. (original) The method of claim 1, with additional steps of:
depositing a layer of electrically and thermally conductive material over said anchor posts protruding through said openings provided through said contact surfaces, thereby including a surface area of said heat spreader surrounding said openings provided through said contact surfaces; and
curing said deposited layer of electrically and thermally conductive material.

10. (original) The method of claim 9, said electrically and thermally conductive material comprising a material selected from the group consisting of epoxy to which traces of silver have been added and solder paste and a solid metal.

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Claims 11-33: (canceled)

34. (new) A method for anchoring a heat spreader of a Plastic Ball Grid Array (PBGA) package to the surface of an underlying substrate of the PBGA package, comprising the steps of:

- (a) providing a substrate for a PBGA package, said substrate having been provided with heat spreader anchor posts over the surface thereof, said heat spreader anchor posts being separated by a first distance;**
- (b) providing a heat spreader for a PBGA package, said heat spreader comprising:**
 - (i) a horizontal portion, being parallel with the surface of said substrate of said PBGA package;**
 - (ii) heat spreader stand-off features;**
 - (iii) said heat spreader stand-off features having a contact surface providing contact between said heat spreader and said substrate;**
 - (iv) said contact surface of said heat spreader stand-off features having been provided with openings there-through; and**
 - (v) said openings provided through said contact surfaces being separated by a distance of said first distance;**
- (c) aligning said anchor posts provided over the surface of said substrate with said openings provided through said contact surfaces of said stand-off features of said heat spreader;**
- (d) inserting said anchor posts provided over the surface of said substrate into said openings provided through said contact surfaces of said stand-off features of said heat spreader, creating anchor posts protruding through said openings provided through said contact surfaces;**
- (e) depositing a layer of electrically and thermally conductive material over said anchor posts protruding through said openings provided through said contact surfaces, thereby including a surface area of said heat spreader surrounding said openings provided through said contact surfaces; and**
- (f) curing said deposited layer of electrically and thermally conductive material.**

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35. (new) The method of claim 34, said anchor posts comprising deposits of thermally and electrically conductive material, said thermally and electrically conductive material having been cured after deposition thereof.

36. (new) The method of claim 34, said anchor posts comprising a material selected from the group consisting of epoxy to which traces of silver have been added and solder paste and a solid metal.

37. (new) The method of claim 34, said heat spreader having a first and a second surface, said first surface facing said substrate, said first surface having been provided with a layer of electrically non-conductive material.

38. (new) The method of claim 37, said providing said first surface of said heat spreader with a layer of electrically non-conductive material comprising a method selected from the group consisting of coating and depositing and chemically treating the first surface of said heat spreader.

39. (new) The method of claim 34, said anchor posts having been created applying methods is dispensing or printing of electrically and thermally conductive material.

40. (new) The method of claim 39, said conductive material comprising epoxy to which traces of silver have been added.

41. (new) The method of claim 34, said anchor posts having been created applying methods of solder bump or contact point creation.

42. (new) The method of claim 34, said electrically and thermally conductive material comprising a material selected from the group consisting of epoxy to which traces of silver have been added and solder paste and a solid metal.